

## **Claims**

1. A method of forming a lightly doped drain comprising:  
providing a semiconductor structure;  
forming an insulating layer on said semiconductor structure;  
forming a conductive layer on said insulating layer;  
forming a photo resist layer, having a transferred pattern, on said conductive layer;  
removing a portion of said conductive layer to expose a portion of said insulating layer, said step of removing uses said photo resist layer as a first mask;  
implanting multiple (M) first ions into said semiconductor structure, said step of implanting uses said photo resist layer and said conductive layer as a second mask;  
isotropic etching a portion of said conductive layer such that undercut of said conductive layer under said photo resist layer is observed;  
removing said photo resist layer; and  
implanting multiple (M) second ions into said semiconductor structure to form said lightly doped drain, said step of implanting uses said undercut conductive layer as a third mask.
2. A method according to claim 1, wherein the semiconductor structure including a substrate and a polysilicon structure on said substrate.
3. A method according to claim 2, wherein the step of implanting said M first ions comprises implanting said M first ions into said polysilicon structure.
4. A method according to claim 2, wherein the step of implanting said M second ions comprises implanting said M second ions into said polysilicon structure.
5. A method according to claim 1, wherein the said conductive layer including a metal layer.

6. A method according to claim 1, wherein the step of removing a portion of said conductive layer comprises dry etching a portion of said conductive layer.
7. A method according to claim 1, wherein the step of forming said insulating layer comprises forming an oxide layer and a silicon nitride layer on said oxide layer.
8. A method of forming a lightly doped drain, said lightly doped drain is formed in a thin film transistor, comprising:
  - providing a glass substrate and a polysilicon structure on said glass substrate;
  - depositing an insulating layer on said polysilicon structure and said glass substrate;
  - depositing a metal layer on said insulating layer;
  - forming a photo resist layer, having a transferred, pattern on said metal layer;
  - dry etching a portion of said metal layer to expose a portion of said insulating layer,
    - said step of dry etching uses said photo resist layer as a first mask;
  - implanting multiple (M) first ions into said polysilicon structure, said step of implanting uses said photo resist layer and said metal layer as a second mask;
  - isotropic etching a portion of said metal layer such that undercut of said metal layer under said photo resist layer is observed;
  - removing said photo resist layer; and
  - implanting multiple (M) second ions into said polysilicon structure to form said lightly doped drain, said step of implanting uses said undercut metal layer as a third mask.
9. A method according to claim 8, wherein the step of isotropic etching comprises wet etching a portion of said metal layer.
10. A method of forming a lightly doped drain comprising:
  - providing a semiconductor structure, said semiconductor structure including a substrate and a polysilicon structure on said substrate;

forming an insulating layer on said semiconductor structure;

forming a conductive layer on said insulating layer;

forming a photo resist layer, having a transferred, pattern on said conductive layer;

removing a portion of said conductive layer to expose a portion of said insulating layer, said step of removing uses said photo resist layer as a first mask;

implanting multiple (M) first ions into said polysilicon structure, said step of implanting uses said photo resist layer and said conductive layer as a second mask;

isotropic etching a portion of said conductive layer such that undercut of said conductive layer under said photo resist layer is observed;

removing said photo resist layer; and

implanting multiple (M) second ions into said polysilicon structure to form said lightly doped drain, said step of implanting uses said undercut conductive layer as a third mask.

11. A method of forming a lightly doped drain, said lightly doped drain is formed in a thin film transistor, comprising:

providing a glass substrate and a polysilicon structure on said glass substrate;

depositing an insulating layer on said polysilicon structure and said glass substrate;

depositing a metal layer on said insulating layer;

forming a photo resist layer, having a transferred, pattern on said metal layer;

dry etching a portion of said metal layer to expose a portion of said insulating layer, said step of dry etching uses said photo resist layer as a first mask;

implanting multiple (M) first ions into said polysilicon structure, said step of implanting uses said photo resist layer and said metal layer as a second mask;

isotropic etching a portion of said metal layer such that undercut of said metal layer

under said photo resist layer is observed, said step of isotropic etching including a step of wet etching;  
removing said photo resist layer; and  
implanting multiple (M) second ions into said polysilicon structure to form said lightly doped drain, said step of implanting uses said undercut metal layer as a third mask.